Goddard Earth Sciences Data and Information Services Center (GES DISC)

The Giovanni News

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Volume 3

Issue 1

In this issue:

Giovanni 3.1.0 has been released!

Version 3.1.0 of Giovanni has been released and is in operational status.

Some of the highlights of this release are:

- A subset of MERRA (Modern Era Retrospective-Analysis for Research and Applications) data products corresponding to A-Train satellite swath data;
- new data parameters in Aerosol Daily and Aerosol Monthly, and enhancement to the MISR Daily, MISR Monthly, and CERES interfaces;
- improved graphics, including modifications to the color bar when displayed vertically, and refinements of the display for the new Histogram service; and
- new data products added to MAIRS Monthly and Ocean Color Radiometry.

For MAIRS, the Monsoon-Asia Integrated Regional Study, methane, carbon monoxide, and carbon dioxide data products from AIRS were added. Chapter 24 of the Giovanni Online Users Manual, corresponding to the MAIRS interface, was published; the interface is linked to Chapter 24 via the Help button.

Giovanni is on Facebook

To foster interaction, discussion, innovation, and even fun with Giovanni, the pioneering remote sensing data analysis system from the GES DISC, a new Facebook group has been formed. The Facebook group is called "NASA Giovanni Remote Sensing Data Analysis," and you can find it directly with this URL: http://www.facebook.com/group.php?gid=389363671578.

Otherwise, search in Facebook groups for "NASA Giovanni," and you should be able to find it. (If you just search for "Giovanni," you'll find a lot of men named Giovanni). Membership is by request; the group admins will add you. Announcements and news about Giovanni will be posted here, along with previews of meeting presentations and papers directly from the authors, and events and unique imagery. We hope that, as the group grows, it will create opportunities for exchanging ideas on how to use Giovanni for research and education. We also anticipate that discussions in the Facebook group will lead to new ideas for capabilities and data sets that can be added to Giovanni.

So what are you waiting for? Join the Giovanni Facebook group now!

New SeaWiFS Data Products, including PAR

PAR stands for Photosynthetically Available Radiation

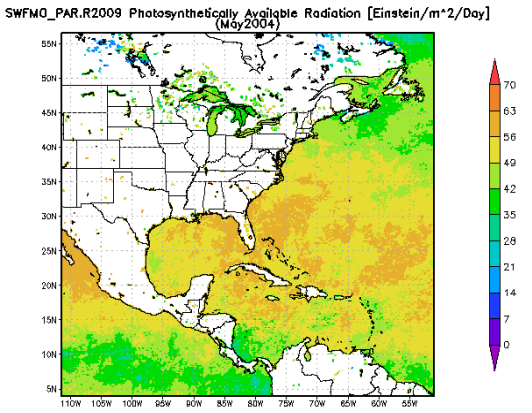
The recent data reprocessing performed by the Ocean Biology Processing Group (OBPG) at Goddard Space Flight Center provided a few new data products derived from the observational archive of the Sea-viewing Wide Field-of-view Sensor (SeaWiFS). The three new data products are Particulate Organic Carbon (POC), Particulate Inorganic Carbon (PIC), and Photosynthetically Available Radiation (PAR). A brief description of these new data products is provided below.

***Particulate Organic Carbon (POC)*:** POC is carbon particles in water too large to pass through a filter; dissolved organic carbon (DOC) is carbon in water that passes through the filter. The usual filter pore size is 0.7 µm for glass fiber filters.

***Particulate Inorganic Carbon (PIC)*:** PIC represents calcium carbonate ($CaCO_3$) particles in water, predominantly from coccolithophorids and foraminifera.

***Photosynthetically Available Radiation (PAR)*:** Photon flux density (photons per second per square meter) within the visible wavelength range (usually 400 to 700 nm). It indicates the total energy available to plants for photosynthesis.

These new data products will also be added for MODIS-Aqua ocean radiometry data when the reprocessed data becomes available in Giovanni in the near-future. MODIS-Aqua data reprocessing commenced in late February 2010. Ocean Color Radiometry Giovanni is supported by an ongoing advanced water quality product project, and will be further supported by a bio-optical drifting float project starting next year.



The image at left of SeaWiFS PAR for May 2004 includes the northwest Atlantic, the Gulf of Mexico and Caribbean Sea, and the eastern tropical Pacific. Springtime PAR is high the Gulf and Atlantic, but cloudiness from the Intertropical Convergence Zone reduces PAR in the Pacific.

Oceanographic scientists really like Giovanni

At the AGU Ocean Sciences Meeting this February in Portland, Oregon, several oceanographic scientists told GES DISC staff in attendance that Giovanni was (a) fun to use, (b) good for research, and (c) great for students. In particular, Dr. Richard Barber, noted emeritus professor of the Duke University Marine Lab, said that he was a Giovanni "junkie," and that his wife had to make him go to bed when he was up late making Giovanni plots (he particularly likes Hovmöller plots). Other scientists suggested that we should come up with a way to put "personalized" ocean data into Giovanni to make use of its analytical capabilities. Some professors also expected to utilize Giovanni for new educational projects. Keep those ideas coming, scientists!

The three most unusual Giovanni publications of 2009

The use of Giovanni by the geoscience research community continued to increase during the year 2009, as demonstrated by the large number of peer-reviewed publications in which Giovanni analyses were utilized. Some of these publications seemed a bit unusual to us, so we decided to award gold, silver, and bronze medals in the category *Most Unusual Use of Giovanni in Research during 2009.*

Catry, T., Ramos, J.A., Le Corre, M., and Phillips, R.A. (2009) Movements, at-sea distribution and at-sea behaviour of a tropical pelagic seabird: the wedge-tailed shearwater in the western Indian Ocean. *Marine Ecology Progress Series*, 391, 231–242, doi: 10.3354/meps07717.

Kishcha, P., Starobinets, B., Kalashnikova, O., Long, C.N., and Alpert, P. (2009) Variations of meridional aerosol distribution and solar dimming. *Journal of Geophysical Research*, 114, D00D14, doi:10.1029/2008JD010975.

Vignolles, C., Lacaux, J-P., Tourre, Y.M., Bigeard, G., Ndione, J.A., and Lafaye, M. (2009) Rift Valley fever in a zone potentially occupied by *Aedes vexans* in Senegal: dynamics and risk mapping. *Geospatial Health* 3(2), 211-220.

For all the publications, go to the Giovanni home page (http://giovanni.gsfc.nasa.gov) and look for "Publications" in the navigation menu on the left side.

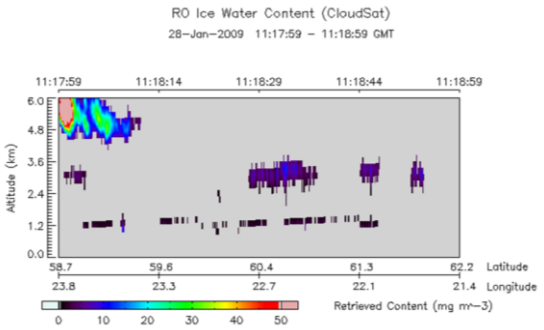
From the GES DISC News: Aircraft icing event analyzed with Giovanni

A serious aviation concern is conditions that cause ice to form on airplane wings. Ice formation can significantly and adversely affect airworthiness, sometimes very quickly; it only takes a small layer of ice to make flying much more difficult. For that reason, aviation weather forecasters attempt to forecast where and when icing conditions might occur, and meteorologists analyze conditions where icing was reported by pilots.

A recent GES DISC News item highlighted a paper presented at a conference in Switzerland, which discussed a reported aircraft icing event over Finland. The analysis utilized Cloudsat data to characterize the icing conditions in the atmosphere near where a pilot reported significant icing.

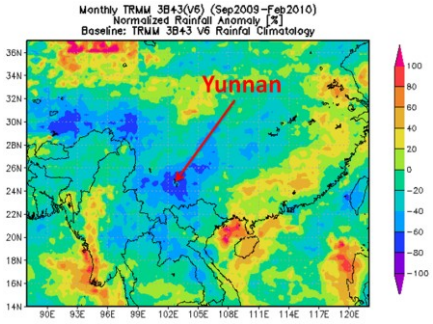
On January 28, 2009, the pilot of a military aircraft near Kuopio Airport in south-central Finland reported "heavy icing conditions" between 10,000 and 14,000 feet (3000-4300 meters above sea level). Jarkko Hirvonen of the Finnish Meteorological Institute examined the weather conditions in the region during this reported icing event, and concluded that the actual conditions would only have caused light to moderate icing, rather than the heavy icing in the pilot report. (He noted that pilot reports of icing can be "highly subjective.")

Cloudsat water content profile, January 28, 2009



One of the key elements of Hirvonen's analysis was Cloudsat data, which he utilized by employing the Giovanni A-Train data interface. Hirvonen generated Cloudsat profiles of Ice Water Content and Liquid Water Content from a Cloudsat track that passed about 380 km from the airport, with a 3 hour time difference. Despite this difference in time, Cloudsat data were used to analyze the middle cloud layer in which the icing occurred. Hirvonen's primary conclusion was that the middle cloud layer was mainly composed of supercooled liquid water, and there was only a small amount of cloud ice. His analysis of the satellite data also indicated it was unlikely that there was a significant presence of supercooled large droplets (SLDs) which could have caused heavy icing, even though meteorological analysis suggested that some SLDs could have been formed at that altitude. Data from MODIS on the Aqua satellite, which is also in the A-Train constellation, were also used to analyze the event.

Why doesn't Giovanni provide more anomaly analysis?



Anomaly analysis, which utilizes a long-term climatological mean for the calculation of deviations from the mean (called *anomalies*) is a powerful tool for the analysis of geophysical data. One of the most familiar examples of anomaly analysis is the plot of increasing global temperatures as anomalies from the global mean temperature, usually from the mid-20th century. This plot of temperatures shows cold anomalies were prevalent in the early part of the 20th century, and warm anomalies occurred more frequently in the late 20th and early 21st century.

Some Giovanni interfaces provide the capability to analyze their data with climatological anomaly analysis. MODIS aerosol optical depth, monthly TRMM precipitation, and several SeaWiFS ocean color radiometry parameters feature the capability to calculate and visualize these data using anomalies. The image shown above right is an example of the TRMM monthly rainfall anomaly, which shows the extent and severity of the rainfall deficit that occurred in southwestern China between September 2009 and February 2010 (and is continuing at present). The TRMM 3B43 monthly climatology was generated using GrADS (Grid Analysis and Display System). It includes all 3B43 monthly data between Jan 1998 and Dec 2009.

So, one may ask, if anomaly analysis is so useful, why don't more data parameters and Giovanni interfaces have it?

The answer to this question is that, in order to have anomaly analysis capability, a climatology for the data parameter is required. The GES DISC has only made a few climatologies just for Giovanni, and has not created an "on the fly" capability for users to make their own climatologies. (The SeaWiFS climatology was acquired from the Ocean Biology Processing Group.) The main reason is that there are many different ways to average data spatially and temporally to construct climatologies, and making them for Giovanni is a process that takes time and care. Allowing users to create climatologies could result in analysis results that are not consistent. Thus, only a few selected data parameters feature the current anomaly analysis function in Giovanni. Note also that many remote sensing data sets in the EOS era are just now getting long enough to encompass the full range of variability that allows the long-term mean values in a climatology to be "average" enough to make an analysis of anomalies meaningful and useful for data interpretation.